$I_m = \frac{U_{Rm}}{R} = \frac{0,5}{100} = 5.10^{-3}\,A$ donc

$r = \frac{U_m}{I_m} - R \Rightarrow r = \frac{0,6}{5.10^{-2}} - 100 = 20\Omega$

$\Rightarrow L\omega = \frac{1}{C\omega} \Rightarrow LC\omega^2 = 1$ or $\omega = 2\pi N$ d'ou $4\pi^2.LC.N^2 = 1$

4°) $u(t) = Um \sin(\omega t + \varphi_C)$

$\rightarrow U_m = 0,6V$

Et $\omega = 2\pi N_1 = 2\pi \times 625 = \underline{125\pi\ rad.s^{-1}}$

A $t = 0$; $u(0) = U_m \sin \varphi_u = 0$

$\rightarrow \varphi_u = 0$ (car $\cos \varphi_u > 0$)

Donc $u(t) = 0,6.\sin(1250\pi.t)$ (en v)

$i(t) = I_m \sin(\omega t + \varphi_i)$

Or $I_m = 5.10^{-3}$ A et $\varphi_i = \varphi_{uR} = \varphi_u = 0$

Alors $i(t) = 5.10^{-3}.\sin(1250\pi.t)$ (en v)

II-

1°) $T_2 = 0,25 \times 8 = 2.10^{-3}.s$

$N_2 = \frac{1}{T_2} = 500$ Hz

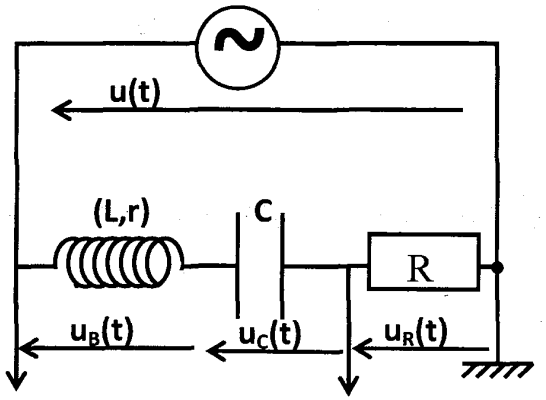
2°) $\Delta t = \frac{T_2}{8}$

$\Delta\varphi = \omega.\Delta t = \frac{2\pi}{T_2} \times \frac{T_2}{8} = \frac{\pi}{4} rad$

On a : u_R est en avance par rapport à u $\Rightarrow \varphi_{uR} - \varphi_u = \frac{\pi}{4}$

Or $\varphi_u = 0$ Alors $\varphi_{uR} = \varphi_i = \frac{\pi}{4}$

3°)



D'après la loi des mailles :

$u_B(t) + u_c(t) + u_R(t) = u(t)$

$$L.\frac{di}{dt} + ri + \frac{q}{C} + Ri = u$$

$$\Rightarrow L.\frac{di}{dt} + (r+R)i + \frac{1}{C}\int idt = u$$

$u(t) = U_m \sin(\omega t)$: $\varphi_u = 0$

$i(t) = I_m \sin(\omega t + \varphi_i)$; $\varphi_i = \frac{\pi}{2}$

•$(R + r)i = (R + r)\, I_m \sin(\omega t + \varphi_i) \rightarrow \overrightarrow{v_1} \begin{pmatrix} (R+r)I_m \\ \varphi_i \end{pmatrix}$